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Architectural Education

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ARCHITECTURAL EDUCATION includes the training of personnel for professions or occupations in or related to the building industry. In addition to architects, these personnel embrace technical specialists such as structural engineers and building contractors; subprofessional personnel such as specification writers, superintendents, draftsmen and delineators; and persons in certain commercial occupations such as sales engineers for building materials and equipment. However, this report is concerned only with curriculums which train for professional practice as a licensed or registered architect. These curriculums may include accredited curriculums in architectural engineering, architecture-structural option, or similar fields.

The Architect

The function of the architect is to exercise professional leadership in the farflung building industry and to practice the complex art and science of planning and designing structures for human occupancy and use which are functional and efficient, safe and structurally sound, and esthetically satisfying. The position of the architect in building is analagous to that of the "systems engineer" in other industries that are based on science, research, and technology. He is the generalist, the technologists are the specialists; both are indispensable. The architect's position and function are defined by law in all States.

The difficult educational specification is that the architect must know enough of the theory and practice of the specialized technologies, but he can not be a specialist in any one of these. He must also have a general understanding of the contributory social sciences. His position and its requirements have been well indicated in the following language.

"To a building project the architect brings acquirements and a range of services that cannot be matched by any other factor in the operation. He is not a building contractor, nor is he a structural engineer; neither is he a banker or real estate agent; yet he must have enough experience to advise his client on the respective weight of each element that these individuals bring to his project. He must recognize quality of construction and value of property; he must understand financing and kindred matters that will enable the owner to forecast the value of his investment both at the completion of his building and through the years to come. From start to finish he is the one person in the building industry

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whose interests are identical with the owner's. He is his client's professional adviser and representative; he plans, he specifies, obtains bids, draws contracts, supervises the progress of the work, oversees construction accounts; he is, in a word, the administrative head of a complex operation carried out by many hands. He must indeed be a man of many talents." [1]

Number of Architects; Demand and Supply

The 1950 United States census reported 25,000 architects, but the census definition is not limited to licensed architects. (See table 1.) The American Institute of Architects' survey in 1950 reported a total of 19,183 licensed architects.

Table 1.—Number of architects in the United States reported by the Decennial Census, 1870–1950*

Year	Number	Year	Number	Year	Number
1870	2,038	1900	10,481	1930	21,621
1880	3,350	1910	16,311	1940	21,976
1890	8,048	1920	18,048	1950	25,000

*The data for years preceding 1940 were compiled on a slightly different basis from that used in more recent years.

Source: Bureau of the Census.

Recent studies made by the American Institute of Architects Survey Commission and by the Study Commission for Architectural Education of the Southern Regional Education Board indicate increasing demand for architectural services due to: Increased population; increased ratio of urban population; greater complexity of building construction requiring coordination; new and more complex types of buildings requiring skilled planning; increasing cultural maturity and higher living standards; and younger practitioners establishing themselves in smaller communities, previously serviced from larger cities for only larger projects.

The large number of students enrolled in collegiate schools (11,000) does not necessarily represent a potential oversupply. The curtailed training during the war and the present armed service induction of graduates have caused a shortage of draftsmen and junior or candidate architects at the present time.

According to all economic and social indices which can be adduced, there will not be enough architecturally trained personnel in 1960.

[1] H. Daland Chandler, "What is an Architect?" in *Architecture*: A Profession and a Career (Washington, D. C., The American Institute of Architects, 1945, p. 12–13).

Professional Organization

The national professional association in architecture is the American Institute of Architects, founded in 1857, on the groundwork of an earlier lapsed organization, the American Institution of Architects established in 1837. The institute now has 9,642 members and fellows. It is estimated that about 14,000 of the Nation's registered architects are eligible for membership in the institute. All members must be registered architects, except teachers and editors admitted by action of the board of directors.

Fellows are members who are advanced to this rank by a jury from among those nominated by other members. They usually comprise between 3 and 5 percent of the total membership. All members and fellows are assigned to chapters—there are 108 chapters—by residence or location of office.

The institute is incorporated under the laws of the State of New York. Its operating headquarters are in Washington, D. C., in the historic Octagon House.

In addition to a variety of pamphlets, bulletins, service documents, and contract forms used by the entire profession, the institute publishes three periodicals: *The Journal of the American Institute of Architects*, issued monthly; *Memo*, a 4-page flash news sheet issued fortnightly; and the *Bulletin of the American Institute of Architects*, a publication containing abstracts of technical and research publications, reference guides, and other technical information, issued bimonthly.

Licensure

Laws have been enacted in all States, the District of Columbia, Alaska, Hawaii, and Puerto Rico requiring architects to be registered or licensed. The first State to require licensure was Illinois in 1897. By 1920 only 19 States had passed such laws, and 11 more were added in the following decade. Wyoming, the first State to license engineers, was one of the last two (with Vermont) to license architects, 1951.

There is still considerable lack of uniformity between the States with respect to mandatory or permissible use of the title of architect; exemption for size, type, or dollar volume of building; relationship of licensing of architects to licensing of professional engineers; nature and length of examinations; and preferential treatment of graduates of accredited schools.

Registration requirements vary in the different

States. Most laws require graduation from an approved school of architecture plus 3 years of experience for admission to examination; or in lieu of this combination, a long period of practical experience. The examination is conducted by a State licensing or registration board.

Architects may be commissioned to design projects in States other than their State of original registration and are then faced with the necessity of securing registration in other States. Reciprocity arrangements between some of the States have in the past made that possible without examination or personal appearance. However, the procedure was far from general, there was great disparity in standards, and there were other undesirable features in direct reciprocity. This situation led to the formation of the National Council of Architectural Registration Boards in 1920. It is composed of representatives of the various State boards.

The Council has established Junior and Senior examinations, both of which are administered by State boards on behalf of the council. The candidate may take the examination only after he has submitted to the Council satisfactory credentials and record of education and experience. National council certificates are awarded to successful candidates, the council holding complete records for reproduction as may be required.

The Junior procedure (filing records, giving 4-day examinations, and awarding certificates) is for those of limited experience seeking their first registration. The Senior procedure (including an oral rather than a written examination) is for architects of 12 years' practice as responsible principals.

The holder of a council certificate seeking new registration in a given State instructs the council to send copies of his record and certification to the board of that State, with reasonable assurance that he will be granted registration without examination or personal appearance. However, the State boards have not delegated their authority, and the council certification is not binding on them.

In order to promote improved and more uniform standards and procedures, the NCARB issues recommended examination syllabuses and model registration laws for the guidance of the State boards in their respective internal operations.

Evolution of Architectural Education

The antecedents of professional schools for the training of architects are found in several European countries. Their rise during the 18th and specially the 19th centuries was a gradual transition from the age-old apprentice system, motivated by the inadequacies and the abuses of that method. One early school in England originated as a voluntary association of disgruntled apprentices.

The most pronounced influence on American development has come from the Ecole des Beaux Arts, established in Paris in 1816, one of the first completely organized schools. In it the principles and the various categories of architectural knowledge were analyzed and separated into distinct courses of instruction, and there the ancient methods of apprenticeship training were modified and adapted to the work of a well-organized school.

The first organized curriculum in architecture in the United States was established in the Massachusetts Institute of Technology in 1865. The University of Illinois, then the Illinois State Industrial University, offered architectural instruction in 1868, Cornell University in 1871, and Syracuse University in 1873.

French influence has been prominent in architectural education in the United States, especially in the methods of teaching design. It was due in part to the fact that many American architects in the past received a part or all of their technical training in Paris at the Ecole des Beaux Arts. In the Paris tradition, emphasis in design teaching was placed on the solving of problems rather than on the lecture as a means of teaching and learning. The French influence has been strengthened and perpetuated partly through the Beaux-Arts Society of Architects organized in New York in 1894 and by a later organization called the Beaux-Arts Institute of Design, also founded in New York.

For half a century architectural education was dominated by a group of French architects, professors of design, imported as "patrons" or critics, one in each leading school. While they have left indelible marks on the American schools, they have been replaced by their American students, and the French influence has definitely waned. The BAID, organized and dominated by Paris-trained Americans, has also declined in influence, with the rise of a variety of individual and regional theories of architectural education. For the past two decades there has been a strong influence directly from Germany and Austria, former leaders, teachers, or students of the Bauhaus being imported as were the Frenchmen of the previous generation. This in-

fluence has also been ingested into the American system, and the Europeans have been succeeded by American followers. One should not, however, overrate these influences on architecture and architectural education in the United States.

Since 1900 the number of schools of architecture has increased rapidly with the result that at present at least one is found in each of 34 States. There are also 5 schools in Canada.

Educational Surveys

In recent years a number of surveys have been made of architectural education. The first of these was conducted by Prof. F. H. Bosworth of Cornell University and Prof. Roy Jones of the University of Minnesota. The findings were published in 1932 under the title, *A Study of Architectural Schools.*

The second study was made in 1940 by Prof. George Young of Cornell University and Prof. Goldwin Goldsmith of the University of Texas. A limited edition of the report was published in mimeographed form.

The third study was undertaken in 1950 by an 11-man commission appointed by the president of the American Institute of Architects to make a survey of architectural education and registration. The project is being financed almost entirely by the Carnegie Corporation, which has appropriated $87,500 for the work. The AIA has provided the services of its director of education and research, some secretarial service, and office space. The report is to be submitted to the AIA this year and to be published early in 1954.

The main part of the survey, based on a 50-percent response to a 49-item questionnaire sent to 19,000 architects, and on 4 special questionnaires to all deans, teachers, State board secretaries, and State board members, is unique in its scope and in combination of factual and opinion responses. An unusual feature of the survey was the series of 10 small conferences, arranged by the Commission members in their respective areas, in which men and women of many professions and occupations (not including architects) discussed questions of the social, economic, and political future of America, the probable pattern of urban life, and the kinds of education recommended for professional leaders, including architects. The proceedings, which have been collated in a single document, are to be published as a separate volume under the title, *Conversations Across the Nation.*

Educational Associations

The principal association in architectural education is the Association of Collegiate Schools of Architecture, which was established in 1912. Membership in this organization is by schools, represented by deans, directors, or heads of departments of architecture, and other faculty members. The actions of the association are not binding on member schools. An annual meeting is held, and informal regional meetings are also held annually.

Before the National Architectural Accrediting Board (described later) was established, State boards, veterans' agencies, and other organizations tended to regard membership in the ACSA as tantamount to accreditation, against the intent and wishes of the association. During that period membership was rather selective; admission was by vote of the association at its annual meeting. Since the establishment of the NAAB the association has made an effort to include all degree-granting collegiate schools of reasonable standards. The total of the member schools is now 57, three of them Canadian schools. The association is in effect a society for architectural education.

The American Architectural Foundation was established in 1942. Its charter requires that the trustees be corporate members of the American Institute of Architects. The objective is to promote education and research through the solicitation of funds which it allocates to approved projects.

The Society of Architectural Historians, established in 1940, includes in its membership of about 200—teachers, scholars, historians, and researchers in the field of the history of architecture, a standard required subject in all professional schools of architecture. Membership also includes nonacademic practitioners and teachers of art history in nonprofessional schools. The AIA and the American Architectural Foundation partially subsidize the SAH *Journal*, which is published four times a year.

Accreditation

The accreditation of schools of architecture is done by the 6-man National Architectural Accrediting Board appointed by the president of the American Institute of Architects for staggered terms of 6 years. Two members represent and are nominated by the National Council of Architectural Registration Boards and two similarly by the Association of Collegiate Schools of Architecture. Only very rarely does the AIA president make appointments to

these four positions other than those nominated, and then only after consultation with the officers of the group involved.

The board was established in 1940, but it has functioned fully only since 1945. Under the charter, which forbids it to establish a standard curriculum, the board elects its own officers and enacts its own operating rules. Its members may be advised but cannot be instructed by their respective parent bodies. The AIA therefore has no direct control of NAAB and accrediting.

Schools of Architecture

The number of institutions in the United States offering professional curriculums in architecture has grown from 13 in 1900 to 64 in 1953. All but two of the degree-granting schools of architecture are parts or divisions of recognized universities, colleges, or institutes of technology. Their administrative relationships are varied. (See table 2.) In the past there were a larger number of departments of architecture in colleges of engineering and institutes of technology than at present; the trend is toward organizing the instruction in autonomous or semi-autonomous schools. In a number of institutions the school or department of architecture is the dominant element in a college or school of fine arts, design, architecture and applied arts, or architecture and allied arts.

Table 2.—Administrative relationships of schools and departments of architecture

Administrative pattern	Number of schools		As an example, the school in—
	Accredited	Non-accredited	
a. Autonomous school or college of architecture; dean responsible directly to the president or provost.	5	1	Columbia University.
b. Semi-autonomous school (not department); head responsible to a dean of a college of liberal arts, fine arts*, or engineering.	8	3	Syracuse University.*
c. Department or school within a college, the title of which includes architecture.	8	0	University of Michigan.*
d. Department within a college of fine arts, applied arts, etc.*	7	3	Yale University.
e. Department in a college of engineering or institute of technology.	17	10	Pennsylvania State College.
Total	45	17	

*In some instances the dean of the college is an architect.

In 1952–53, 64 schools and departments of architecture in the United States enrolled 10,735 professional students. (See table 3.). Of this number, 3,293 were new students, and 1,801 were graduated.

Table 3.—Students enrolled in schools of architecture in the United States and Canada, 1952–53

	United States	Canada
Schools reporting	64	5
New professional students	3,293	102
Candidates registered for:		
First professional degree	10,519	560
Second professional degree	216	8
Nonprofessional students taking courses	6,631	185
Students graduated with:		
First professional degree	1,674	87
Second professional degree	127	4

The enrollment in the United States and Canada over the past 20 years has run as follows: 1931, 5,900; 1939, 4,300; 1944, 1,700; 1951, 11,300. Since 1939 the enrollment has increased 163 percent.

Schools of architecture, compared with other professional schools, are generally small. In 1939 the median school in the United States and Canada had only 70 students, and three-fourths of all schools had fewer than 100; in 1953 the median enrollment was 142, but three-fourths of all schools had fewer than 200, and one-fourth fewer than 100.

Student mortality in schools of architecture is rather high. In general, only 1 student graduates for every 2½ who enter. Selective admission in the few schools where it is practiced markedly reduces the mortality. This high rate of attrition is not educationally satisfactory, but the profession does not regard it with alarm for the general reason that many students who do not remain in school to graduate become professional assistants and subprofessional technicians required by practicing principal architects. Likewise, transfer of students or "defection" of graduates to related fields, such as construction and sales engineering, is regarded as on the whole beneficial to the profession (if not to the student).

Admission Requirements

The great majority of the collegiate schools of architecture admit students who have been graduated from secondary schools, but the entrance requirements are far from uniform. Privately controlled

institutions generally limit enrollment, and they are selective in terms of rank of the applicant in his secondary school and other qualifications. Publicly supported institutions, with few exceptions, can be selective only in terms of required secondary school credit in certain subjects. Subject requirements are shown in table 4.

Table 4.—Secondary school credits required in certain subjects for admission to schools of architecture

Subject	Schools of architecture reporting the requirement	Average number of secondary school units required
Mathematics	59	1.84
English	37	3.27
Sciences	23	1.4
Foreign languages	13	2.0
History	11	1.09
Civics/social studies	5	1.75
Drawing	2	1.0

Additional entrance requirements such as aptitude tests, interviews, and entrance examinations are reported in many institutions. Some publicly supported schools state that, although they are not permitted to be selective, they can effect desirable voluntary screening by these means.

Preprofessional education in a college of liberal arts is a prerequisite for admission in 14 schools of architecture, as follows: (a) *1 year*—Universities of Minnesota, Utah, and Virginia, and State College of Washington; (b) *2 years*—Universities of California, Florida, Detroit, and Washington, and Columbia, Stanford, Princeton, and Yale Universities; (c) *4 years* (degree)—Harvard University and Cranbrook Academy of Art.

The Curriculum and Degrees

The great majority of the collegiate schools of architecture offer a 5-year curriculum. A curriculum of this length has been required for accreditation by the NAAB since 1950.

A typical curriculum in architecture now includes the following subjects:

1. Subjects of general educational value and as prerequisites for technical and professional courses: English, mathematics, physics, chemistry, sociology, and economics. Others sometimes included are history, philosophy, and biological sciences. Some elective courses may also be taken.

2. Technical subjects: Mechanics and strength of materials, structural theory, construction (wood, steel, masonry, reinforced concrete), mechanical equipment (heating, ventilation, air conditioning, conveyance, electrical, sanitation, illumination, acoustics), and graphics (instrument and freehand drawing, descriptive geometry, and perspective).

3. Professional subjects, some of which have also general educational values: Design, theory of design, history of architecture, professional practice and ethics, specification writing, office management and contracts, working drawings, model making, modeling and sculpture, and thesis. Electives include art history, archeology, and esthetics.

In general, the straight 5-year curriculums fall into two groups: The integrated curriculums and the divided, or upper and lower division, curriculums. In the former, the general, technical, and professional studies are distributed through 5 years on the assumption that the professional and skill courses are better taught in a longer sequence and that the more mature upperclassman gains more benefit from his courses in economics or philosophy. The proponents of the 2-plus-3 schedule claim the advantages of self-screening in the first 2 years, easier acceptance of transfers or junior college graduates, and intensive coordination of professional and technical work in upper 3 years.

The degree conferred for completion of the professional curriculum in architecture is usually bachelor of architecture, but a very few schools—only 5 of those that are accredited—confer the degree of bachelor of science in architecture. The University of California and the Virginia Polytechnic Institute grant a bachelor of science degree at the end of the fourth year and a master's degree in architecture at the end of the fifth year, but the latter degree in these institutions is considered by the National Architectural Accrediting Board as equivalent to a bachelor's degree in architecture. The number of degrees conferred in recent years is shown in table 5.

Harvard and Princeton permit telescoped schedules for their own general college undergraduates (including those at Radcliffe College) who begin professional studies in third or fourth year which apply as bachelor of arts degree credits, Princeton's first professional degree being master of fine arts at the end of the sixth year. This combination liberal arts and professional degree schedule is possible in most schools as a special curriculum. Yale and the Massachusetts Institute of Technology are cultivating this combination with some liberal arts men's colleges.

A few schools of architecture offer technical institute type courses in such fields as drafting and specification writing. Degree curriculums are sometimes offered in such fields as industrial design, interior decoration, city planning, and landscape architecture. A considerable number of schools offer to nonprofessional students such courses as the appreciation of architecture, history of architecture, and housing and home planning.

Table 5.—Earned degrees conferred in architecture, 1947–48 through 1951–52*

Year	Bachelor's and first professional degrees	Master's and second professional degrees	Doctor's degrees
1947–48:			
Men	943	149	2
Women	131	7	----
Total	1,074	156	2
1948–49:			
Men	1,506	154	2
Women	122	10	----
Total	1,628	164	2
1949–50:			
Men	2,441	159	1
Women	122	7	----
Total	2,563	166	1
1950–51:			
Men	2,556	189	2
Women	88	14	----
Total	2,644	203	2
1951–52:			
Men	2,098	230	----
Women	112	10	----
Total	2,210	240	----

*Compiled from annual reports of earned degrees made by the Office of Education.

Graduate Work

A limited amount of graduate work is offered in architecture and closely related fields. For the academic year 1951–52 a total of 25 schools of architecture reported that they conferred 240 master's degrees; no doctor's degrees were reported. (See table 5.) During the 5 years 1947–48 through 1950–51 a total of 7 doctor's degrees were conferred: 5 by Harvard University and 2 by Princeton University.

A survey made in 1950 resulted in the data shown in table 6.

Only a few schools of architecture have well organized graduate programs. Work for the master's degree often represents a shift from architecture to city planning or from architectural engineering to research. The few doctorates are usually taken under a nonarchitectural faculty in such subjects as history, esthetics, theory of design, and engineering.

Graduate work is pursued by students who are preparing to engage in research or to teach. Very few practitioners of architecture engage in graduate study: the 3-year internship essential for practice is a deterring factor in the development of graduate work for them.

The lack of graduate degrees, especially the doctorate, puts the architect at a considerable disadvantage in case he seeks advancement in academic rank or in position in a governmental agency. It may be noted that currently only two deans of schools of architecture hold earned doctorates and that one has no degree. Many full professors hold only bachelor's degrees, and some have no degrees.

Table 6.—Second degrees offered by schools of architecture and numbers of candidates for the degrees, 1950

Second degree	Number of schools offering the degree	Number of candidates for the degree
Architecture:		
M. Architecture	22	90
M. S. in Architecture	3	23
M. A. in Architecture	1	6
M. A	1	0
Ph. D	1	1
City planning:		
M. Town Planning	1	0
M. City Planning	1	4
M. Science	1	4
M. Regional Planning	1	2
M. City and Regional Planning	1	4
M. Community and Regional Planning	1	5
Architectural engineering and building construction:		
M. S. in Architectural Engineering	3	18
M. Architectural Engineering	2	1
M. Building Construction	2	1
Landscape architecture:		
M. Landscape Architecture	1	1

Until very recently the winning of the Rome Prize or the Paris Prize, with consequent study at the École des Beaux Arts (diploma—Architecte Diplôme pour le Gouvernement Français), or the American Academy in Rome (no degree—entitled to Fellow of the American Academy in Rome) carried much more prestige than a doctorate. Although the luster of these two top prizes has become somewhat dimmed,

the winning of one of them, or one of the lesser traveling fellowships attached to particular schools, carries greater weight with the profession than does advanced academic work.

Post Graduate Offerings

Although the American Institute of Architects survey reveals that a high percentage of registered architects have improved their competence by post-college studies in many professional and related specialties, it is known that this was done on an individual basis under a variety of auspices. Within the past decade there has been a marked upsurge of educational activities among the practicing architects which has been stimulated and fostered by the national and staff officers of the AIA and has, for the time being, taken the form of adult education such as seminars, symposia, and lecture series in conjunction with conventions and regular meetings. Consequently there developed a receptive attitude for more intensive special enrollment courses such as institutes or workshops, which will involve more extensively than at present the faculties and facilities of the professional schools. The present scattered offerings of formal postgraduate work are inadequate in terms of the rapid evolution and increasing complexity of practice and the related technologies.

Some Current Problems

Architectural education is currently beset with a number of problems, some of which it shares in common with other forms of professional education. A few of them will be stated briefly.

First, for the good of the profession and the elevation of professional education in architecture there should be greater selectivity in admitting new students. To admit large numbers of students without screening them carefully lowers the achievement of the professional school, wastes its energies on the incapable, and often does much damage to students who are cast out as failures.

A few schools of architecture employ ways and means beyond the general tests in the university admission procedure to evaluate their applicants. The group as a whole needs to take steps in that direction. Several other forms of professional education have had considerable success with aptitude tests and psychological examinations. Some arrangement with the Educational Testing Service or some other testing agency to develop screening techniques for architecture might well be made.

A 2–3 curriculum plan possesses an advantage over the 5-year integrated curriculum in that th preprofessional years, devoted to education in the liberal arts and sciences, can be used both to provide general education and to screen out the students who do not possess the capacities required to learn the profession of architecture and to succeed in practice. The obvious disadvantage in the arrangement is that it differentiates too sharply between liberal and specialized education.

Second, a problem arises in architectural education because only a limited number of secondary school graduates who apply for admission present a sufficient mastery of such disciplines as mathematics and English and adequate intellectual maturity to undertake professional study. This situation is owing in part to the instruction provided in the high schools.

Third, there is need to develop among architectural students and the members of the profession (*a*) greater appreciation and understanding of research and (*b*) ability to engage in research activities. Building, essentially an ancient craft industry, has adopted some elements of modern science and technology but by no means to the same extent as have many other newer industries. A major objective in architecture is to educate leaders who, without neglecting the creative and human aspects, can complete the conversion of building into a 20th century industry in which research is a central basic tool. This objective requires the development of graduate study and training in research, the amount of which is at present very limited. The conduct of research in or by the professional school helps to develop research attitudes on the part of undergraduates who will become general practitioners.

Fourth, a new approach is needed in the teaching of several subjects of the architectural curriculum. Owing to the close relationship between architecture and structural engineering and to the earlier dominating influence of engineering education, physics and chemistry have been taught frequently as introduction and prerequisite to engineering subjects. In architecture they have, therefore, tended to affect design only through the selection of materials and equipment developed by engineer-manufacturers. This relationship may well continue, but other sciences, notably physiology and climatology, should also be included in the curriculum. Moreover, all these sciences should be taught with much direct reference to human reactions and requirements, and thereby as sources of criteria in design. With more precise and workable knowledge of geography and

climatology the architect's designs may take greater advantage of the favorable forces of nature.

Instruction in esthetics presents peculiar difficulties because it has remained close to philosophy and has not leaned sufficiently upon the experimental psychologists, sociologists, and others who are pioneering in the development of a rational esthetic. The problem here is to develop and teach a more functional and useful esthetic which is related not only to visual but also to other kinds of physio-psychological satisfactions derived from the total impact of the environment which create the sense of well-being.

Fifth, the great breadth of education and understanding required of one in the successful practice of architecture presents a serious problem. It is acknowledged on every hand that a strictly specialized curriculum as a means of educating the professional architect is not adequate in these times of increasing complexity of life and greater interdependence in human relations. While the technical and professional content is not to be underrated, instruction in other subjects broader in character should also be provided to the end that architects may deal intelligently with matters outside their field and be competent to appraise their professional work in its relation to society and to other professions.

Although most schools are constantly reviewing curriculum and methods, there is a strong feeling that occasional adjustments and internal reforms will not solve the problems of professional education in architecture, the complex of the time span, the professional content, and the general content. It is believed that there should be a reexamination and major reorientation of the whole philosophy and structure of higher education, undertaken seriously, objectively, and cooperatively by educators concerned with administration, the liberal arts, and the professional field. Such a study and program would have as its objective the intent that every degree holder shall be educated as well as trained, without further prolongation of the process. It is believed that such a study would find, in the traditions and experience of architectural education, constructive principles potentially beneficial to both professional and general higher education.

Sixth, although the curriculum titled "architectural engineering" and the degree "architectural engineer" have been used for half a century, there is increasing dissatisfaction with them on the part of both architectural and engineering boards of accreditation and licensure. As hybrid terms, they are a source of confusion. Until very recently the National Architectural Accrediting Board would not consider for accreditation curriculums titled "architectural engineering," even though some of them are almost identical with some programs in architecture. Officially, 19 such curriculums are now accredited by the Engineers Council for Professional Development, the engineering accreditation body, but only on the basis of their engineering content.

The confusion is due in some instances to semantics. It would be well not to employ the terms architectural engineering and architectural engineer and to use only the terms architecture and engineering as denoting two different types of activity. The University of Illinois, the first institution to grant the degree in architectural engineering, has recently adopted instead the term "architecture-structural option" for a curriculum as have a number of other schools. Training for structural engineering or building contracting might well be titled "building engineering" or some similar title, omitting the word architecture, and continue under engineering accreditation.

Seventh, in architectural as in other forms of professional education, an ever-present problem is to obtain a sufficient number of competent and inspiring teachers for they are either the bottleneck or the key to the desired result. Schools of architecture compete for staff with the practicing profession. Only as there is an enhanced appreciation of the importance of the profession to society and of the teachers who train the required personnel will the financial support be provided to attract talented professional men into teaching and retain them in academic positions of prestige and dignity. For the schools the problem is also one of providing some training in the art of teaching, both for those who will be the future teachers and for those who are now members of their faculties. The Association of Collegiate Schools of Architecture has only begun to deal with this problem by holding seminars on teaching methods in the several subject matter fields.

Schools of Architecture in the United States and Canada

This list includes 57 member schools of the Association of Collegiate Schools of Architecture as of October 15, 1952, and 12 nonmember schools which offer courses or curriculums in architecture.

The asterisk (*) denotes accreditation by the

National Architectural Accrediting Board. This board's activities do not extend to Canada. The numbers following the names of the schools indicate the enrollment of students in degree curriculums during the year 1952–53.

ALABAMA

Alabama Polytechnic Institute, School of Architecture and the Arts,* 211

ARKANSAS

University of Arkansas, College of Arts and Sciences, Department of Architecture, 72

CALIFORNIA

California State Polytechnic College, Engineering Division, Department of Architectural Engineering, 186
Stanford University, Department of Art and Architecture, 64
University of California, School of Architecture,* 508
University of Southern California, School of Architecture,* 413

COLORADO

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Hamlin, Talbot F. (*ed.*) *Forms and Functions of Twentieth Century Architecture*, 4 vol. New York, N. Y., Columbia University Press, 1952.

Harmon, Arthur Loomis, Architecture—Business, Profession, and Art, *Journal of the American Institute of Architects*, Vol. 20, pp. 93–96 and 144–48, Aug. and Sept. 1953.

Hudnut, Joseph. *Architecture and the Spirit of Man.* Cambridge, Mass., Harvard University Press, 1949. 301 p.

Lescaze, William H. *On Being an Architect.* New York, N. Y., Putnam, 1942. 287 p.

Thorpe, William (Frank Vreeland), *Opportunities in Architecture.* New York, N. Y., Vocational Guidance Manuals, Inc., 1951.

Medical School Enrollments

FOR THE FIFTH CONSECUTIVE YEAR, the total number of students enrolled in approved medical schools has established a new record. The number of students graduated constitutes the largest group ever graduated in one academic year. This was disclosed in the 53rd annual report on medical education, prepared by the Council on Medical Education and Hospitals of the American Medical Association.

Enrollments in the country's 72 medical and 7 basic science schools during 1952–53 totaled 27,688, or 2.3 percent more than the 27,076 enrolled during 1951–52. The 6,668 students who were graduated during the last year exceeds by 279, or 4.4 percent, the previous record established in 1947, when at the termination of the wartime accelerated program several schools graduated more than one class. The estimated number of graduates for 1953–54, based on enrollments reported for senior classes in schools, is even greater—6,831. There was, however, a slight decrease in the size of the entering freshman class for the first time in 5 years—7,425, or 16 less than the record class of 1952–53.

In addition to those regularly enrolled as full-time students of medicine, medical schools had enrolled a total of 140 part-time and special students working toward an M. D. degree, and 407 students in internships that were a part of the degree requirements of the medical schools at which they were educated. There was also a total of 1,734 students from the United States enrolled in 72 foreign medical schools in 22 different countries.

During 1952–53, there were 1,463 women in medical and basic science schools, 8 less than last year. The women comprised 5.3 percent of all students, as compared with 5.4 percent last year. Women in freshman classes totaled 399, against 394 last year. They constituted 6.1 percent of all applicants to medical schools this year, compared with 5.6 percent last year. The actual number of women graduates increased slightly—363, or 5.5 percent of the total, as contrasted to 351 last year. The record number of women graduates, 612, was set in 1949.

A total of 715 Negro students, 2.6 percent of all enrollments, was reported.

The number of veterans enrolled in medical and basic science schools declined for the second year. There were 7,942 veterans enrolled, comprising 28.7 percent of the total student body, as compared with

11,436, or 42.2 percent, last year. There were 36 women veterans.

For the fourth consecutive year, the number of applicants for admission to medical schools, continued to decrease. During the year 1952–53, 16,763 persons applied for admission, a decrease of 3,157 from 1951–52, and 5,516 less than the number who applied in 1950–51.

Combined Curriculums in Engineering and Law

CORNELL UNIVERSITY has recently announced a new program starting this fall under which students may receive degrees in engineering and law in 7 years instead of the 8 years previously required. Students will begin the combined program in the fifth year of engineering school by choosing courses acceptable to both the engineering and the law school.

Five other institutions have been reported to the Office of Education as conducting programs of this type. They are: the University of North Dakota, 2 degrees in 6 years; the University of Wisconsin, 2 degrees in 6½ to 7 years; Purdue University and Indiana University cooperatively, 2 degrees in 6 years; University of Notre Dame, 2 degrees in 6 years.

In a somewhat different program at Iowa State College, 3 years in engineering and 1 in a recognized law school lead to a bachelor's degree in general engineering, following which the student can complete requirements of the law school for its degree.

Stanford Projects in Philippines

A PROGRAM of international cooperation in education to assist in the rehabilitation of the University of the Philippines has been undertaken by Stanford University under a $500,000 contract extending for 2½ years. The program is sponsored and financed by the Mutual Security Agency. Faculty specialists and administrative consultants from Stanford and other institutions will be sent to the University of the Philippines, which will provide $277,500 for the expenses of these persons and their families while they are in Manila. The primary task of the visiting American educators will be to assist the colleges of engineering, education, and business administration in the development of curriculums and teaching methods. Visiting personnel will also assist in the selection of books, equipment, and supplies, and in the development of research activity in all sectors of the Philippine economy. Under separate contracts, Cornell and Michigan Universities are continuing previously inaugurated programs of improving teaching and research in agriculture and public administration. The overall program of these three universities is designed to make the University of the Philippines one of the world's best.

In a related program of the Mutual Security Agency, over 100 Filipino leaders in educational, economic, and social life are to study in America each year. Of this number, about 20 will be faculty members of the University of the Philippines. Orientation programs will be set up at Stanford and at Manila for the benefit of visiting Filipino and American educators, respectively.

Retired Service Personnel Available for Educational Duty

AN INCREASING NUMBER of recently retired personnel from the Government's seven uniformed services are becoming available for educational employment. Within this group are several relatively young persons from a wide variety of fields of endeavor. Often their background of travel, administrative experience, and education, including highly specialized postgraduate work, has been unique. Many have taught in service academies and in other educational programs during their active careers. A substantial number who have undertaken educational assignments since retirement have made excellent contributions to the institutions they are now serving.

Retirement income enables members of this group to accept part-time employment. Compensation which they might receive from non-Federal schools is not subject to the limitations that apply to retired officers employed by the U.S. Government.

An institution or individual seeking further information about the available talent among retired service personnel should write directly to the editor of *The Retired Officer*, the official publication of the Retired Officers Association, 1616 Eye Street, NW., Washington 6, D. C.

Western Interstate Compact for Higher Education

By JENNINGS B. SANDERS*

FOR SEVERAL YEARS there has been a certain amount of regional cooperation among colleges and universities to accomplish selected common purposes.[1] Perhaps the most important of these cooperative arrangements has been the Southern Regional Education Board which has been in operation in the South since September 1948.[2] A somewhat similar arrangement for 11 Western States and the Territories of Alaska and Hawaii [3] is provided for in a compact recently approved by the Congress and the President. (Public Law 226, 83d Cong.)

Purpose of the Compact

The compact was formed because "many of the Western States individually do not have sufficient numbers of potential students to warrant the establishment and maintenance within their borders of adequate facilities in all of the essential fields of technical, professional, and graduate training," and do not have "the financial ability to furnish within their borders institutions capable of providing acceptable standards of training" in these fields.

The Senate Committee on Labor and Public Welfare and the House Committee on Education and Labor in favorably reporting on S. 1515 giving the consent of Congress to the formation of the compact, said of these problems:

> It is evident that the facilities necessary for the provision of modern professional education, particularly in the health professions, are comparatively expensive, both to establish and to maintain. Also, it is generally understood that the provision of education in the major health professions, particularly in medicine, usually can best be accomplished only through establishments affording extensive clinical and laboratory facilities. Some of the less populous areas among the Western States find it difficult, if not impracticable, separately to attempt the establishment of such facilities. Indeed, it is doubtful that there is sufficient present need or economical justification for the development of separate facilities in all these areas for all the professions.

The committees were "advised that in the Rocky Mountain area, a total of 10 States, having over 10 million population, do not have a single institution of higher learning for the teaching of dentistry." Although they thought it might be "impracticable for each of these States to establish separate facilities for this type of education," the committees observed that "the need exists and could be met by the cooperative action" permitted under the bill approving the compact.

The Governing Commission

The compact provides for a commission which shall be a body corporate and shall consist of three members, appointed by the governor, from each compacting State or Territory. One or more commissioners from a majority of the compacting States and Territories shall constitute a quorum; and business may be transacted by a majority vote of the whole number of the compacting States and Territories, each of which is entitled to one vote. The operating costs of the commission are to be apportioned equally among the compacting States and Territories.

The commissioners are nonsalaried but are to be reimbursed for their official expenses. They will elect from their number a chairman and vice-chairman, and may appoint and remove "such officers, agents, and employees as may be required to carry out the purpose" of the compact "and shall fix and determine their duties, qualifications, and compensation, having due regard for the importance of the responsibilities involved."

The commission will submit a budget to the governor of each compacting State and Territory, and will determine costs of providing facilities for graduate and professional education in the region. On or before January 15 of each year, the commission will submit to the governors and legislatures of the compacting States and Territories a report of its activities for the preceding calendar year. The commission is given authority to enter into contractual agreements with institutions and with States and Territories, and will endeavor first "to provide adequate services and facilities in the fields of dentistry, medicine, public health, and veterinary medicine," but may

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[1] On this general subject, see HIGHER EDUCATION, January 1, 1950, a special number devoted to "Regional Action in Higher Education."

[2] *Cf.* William J. McGlothlin, Regional Bootstraps for Higher Education, HIGHER EDUCATION, January 1, 1949, pp. 97–100; George M. Johnson, "The Eightieth Congress and Regional Education," loc. cit., May 1, 1949, pp. 199–200; and John I. Ivey, Jr., and William J. McGlothlin, The South's Evolving Pattern of Regional Planning for Higher Education, loc. cit., pp. 100–103.

[3] *Cf.* G. D. Humphrey, Regional Planning in Higher Education for the Rocky Mountain States, loc. cit., January 1, 1950; and The Western States and Territories Plan for Regional Education, loc. cit., May 1, 1951.

also "undertake similar activities in other professional and graduate fields." It has the duty of undertaking studies of needs and facilities in the region for professional and graduate education and "the long-range effects of the compact on higher education," and of drafting and recommending to the governors of the compacting States and Territories, "uniform legislation dealing with problems of higher education in the region."

Overall Benefits Expected

The congressional committees to whom the approving legislation was referred, reported that its sponsors had outlined certain concrete benefits which could be expected from the compact. (1) States now without training facilities in medicine, dentistry, and veterinary medicine would be in a position to provide educational opportunities for their youth. (2) Established schools would receive a welcome financial boost—in that nonresident students' home States would pay their full cost of training and the schools could add the staffs and equipment required to strengthen educational opportunities and facilities to all students. (3) Qualified students from States without training facilities would be able to secure training in the field of their choice and upon graduation could help to improve the health-service picture in their home States. (4) The West as a region would benefit by pooling its educational resources and planning the maximum utilization of these resources.

Adherents or potential adherents to the compact are the States of Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming, and the Territories of Alaska and Hawaii.

Dartmouth College-Teaching Internships

UNDER A GRANT of $35,000 from the Fund for the Advancement of Education, Dartmouth College this fall is taking part in a pilot program designed to raise the standard of teaching in the undergraduate college and to attract outstanding individuals to the field of higher education.

Plans call for assigning six promising men who have been graduated from college within the last 3 or 4 years and who want to go into teaching to professors whose courses are regarded by colleagues and students as effective. Each intern will work for a year with his assigned teacher in his courses, give some of the lectures, lead discussion groups, and have responsibility for conducting a section, under supervision, if the course is of the multiple-section variety. Supervising teachers and interns will meet regularly in a seminar to discuss teaching methods and problems. Each intern will also be assigned up to 10 undergraduates whom he will counsel. These will be students whose performance in college has not corresponded with estimates of their ability as measured by aptitude and achievement tests taken on entrance to college. This experience should help the intern to understand the specific problems of undergraduates and to relate them to the instruction he is giving in class.

Some of the interns will be housed in undergraduate dormitories in order that they may have an opportunity to understand life in the institution and come into closer contact with students they teach. Thus the program is aimed not only at attracting properly qualified young people to the teaching profession but also at helping them adjust as rapidly and successfully as possible to their work. It represents a departure from the historic approach to college teaching in which the young instructor is left to shift for himself, sometimes to the extreme disadvantage of his students.

NEW PUBLICATIONS

Northeastern University Annual Report of the President, 1951–1952. Boston, Mass., The University, 1953. 36 p.

The Humanities at Scripps College, 1927–1952: Views and Reviews. 1932 Hyperion Ave., Los Angeles 27, Ward Ritchie Press, 1952. 68 p. $2.50.

Six essays and addresses, each by a different author, regarding the origin and development of Scripps College, with emphasis on the humanities.

The Impact of an ROTC Program on a Liberal Arts College: A Case Study at Colgate University, Hamilton, N. Y., Colgate University, 1953. 53 p.

Report of a study by the ROTC Study Committee of the university. Describes the establishment and the evolving character of the Air Force ROTC program at Colgate and makes 10 specific forward-looking recommendations.

Liberal Education Reconsidered, by Theodore M.

Greene. Cambridge, Mass., Harvard University Press, 1953. 46 p. $1.50.

The 1952 Inglis Lecture at Harvard University. Defines the goal of liberal education as (1) "the cultivation of the well-disciplined, highly individualized, and lively mind," (2) "the nurture of man's total personality through structural integration and textural individuation, the development of persons able and eager to enjoy life to the full," and (3) "a preparation for life in a community." Suggests the basic pattern best designed to achieve this objective.

Interstate Cooperation: A Study of the Interstate Compact, by Vincent V. Thursby. Washington, Public Affairs Press, 1953. 152 p. $3.25.

A study and appraisal of the interstate compact; of current interest in education because of regional compacts in higher education now being developed in several sections of the Nation. Describes the Southern Regional Education Compact.

Junior College Directory 1953, by C. C. Colvert and M. L. Litton. Washington 6, D. C., American Association of Junior Colleges, 1953. 51 p. Paper, $1.

Includes a directory of junior colleges, and alphabetical list of junior colleges, directories of junior college organizations and societies, and statistical data on the junior colleges.

Organization for Government of Idaho's Educational System, by a special committee of the faculty, University of Idaho. Moscow, Idaho, The University, 1952. 22 p.

A study of the governing organization for education in Idaho in order to provide a sound basis for public consideration of any changes which might be necessary to keep the State's educational governing system modern and abreast of the needs of the times. Includes recommendations.

Population and Enrollment Trends and Forecasts, State of Washington, by Carl F. Schmid, Warren E. Kalbach, Vincent A. Miller, Fred J. Shanley. Seattle, Wash., Washington State Census Board, 1953. Proc. 60 p.

A chapter on population forecasts in the State and one on enrollment forecasts for schools, 1950–65, and colleges in the State, 1952–65.

Personnel Principles in the Chapter House, by Jessie Rhulman and Others. Washington 6, D. C., American Council on Education, 1953. Series VI, Student Personnel Work, No. 17, Vol. XVII, March 1953. 44 p. Paper, 50 cents.

A special report aimed at being of help to the head resident of the fraternity or sorority chapter house.

Proceedings of the Association of University Evening Colleges, 1952, Atlanta, Ga. Atlanta Division, University of Georgia, 1952. Proc. 130 p. Paper.

Papers and discussions on the theme "New Horizons for the Evening College."

Proceedings of the Third Pacific Northwest Conference of Foreign Language Teachers, held at The University of Oregon, Eugene, Oreg., April 17–19, 1952. Eugene, Oreg., University of Oregon Cooperative Store, 1952. 46 p. Paper, $1.

Six addresses, reports of 6 work groups, and summaries of proceedings of the conference and chapter meetings of associations.

Program of Community Dynamics, Fifth Annual Report. Richmond, Ind., Earlham College, 1952. Earlham College Bulletin, New Series XXXIV, No. 2. 21 p.

Second Annual Report of the Cooperative Program in Educational Administration, Middle Atlantic Region, 1952, by Daniel R. Davies. New York 27, Bureau of Publications, Teachers College, Columbia University. 57 p.

Some Aspects of Internal Auditing in Selected Colleges and Universities, by Burnett Allan Little. Champaign, Ill., Illini Union Bookstore (distributor), 1952. Proc. 119 p. Pressboard, $2.50.

Examines the objectives of internal auditing in 21 colleges and universities to determine current practices and procedures used to achieve these objectives. Based on a study of literature and questionnaire returns. Bibliography of 91 titles.

Students and Staff in A Social Context, by Robert L. Sutherland and Others. Washington 6, D. C., American Council on Education, 1953. Series VI, Student Personnel Work, No. 18, Vol. XVII, March 1953. 39 p. Paper, 50 cents.

Brings together and restates many conclusions regarding extracurricular activities; formulates a current and widely held view concerning the value of such activities.

Study Abroad: International Handbook, Fellowships, Scholarships, Educational Exchange, Vol. V, 1952–53. A UNESCO publication. New York 27, 2960 Broadway, Columbia University Press, 1952. 440 p. $2.

Part I contains general data concerning fellowship and training programs; Part II lists the international fellowships and scholarships available by country.

The Uneducated, by Eli Ginzberg and Douglas W. Bray. New York 27, Columbia University Press, 1953. 246 p. $4.50.

A study of America's uneducated people based on a study of illiterates in the armed services during World War II. Considers many aspects of the question. Among the recommendations is a new formula for a Federal grant-in-aid program to help the States in their war against illiteracy. First major findings of the Conservation of Human Resources Project at Columbia University.

Student Personnel Programs in Transition, by A. J.

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Brumbaugh and Ralph F. Berdie. Washington 6, D. C., 1785 Massachusetts Ave. NW., 1952. Series VI, Student Personnel Work, No. 16, Vol. 16, October 1952. 48 p. Paper, 50 cents.

A description of the consultation program provided through the American Council on Education for institutions interested in developing their student personnel programs, a statement of the personnel point of view, descriptions of prevailing conditions, recommendations to the 80 colleges, and an evaluation of the program.

These Will Go To College, by R. Clyde White. Cleveland, Ohio, The Press of Western Reserve University, 1952. 108 p. $2.75.

A study of future demand for admission to college by secondary school graduates in the Cleveland-Akron-Lorain area—7 counties of Ohio. The chapters deal with population and economic facts, how many went to college, jobs and higher education, social stratification and college enrollment, future demand for admission to college, and what are some of the characteristics of boards of trustees of colleges and universities.

Western College Association Addresses and Proceedings, 1952–53. Pomona College, Calif., The Association, Charles T. Fitts, secretary-treasurer, 1953. 74 p.

Addresses on higher education and international tensions, and on problems of accreditation. A statement on the accreditation policy of the association; a list of the institutions accredited.

When Peoples Speak to Peoples, by Harold E. Snyder. Washington 6, D. C., American Council on Education, 1953. 206 p. $3.

An action guide to international cultural relations for American organizations, institutions, and individuals. The purposes are to throw new light on the significance of international cultural relations and to provide a manual for use by agencies and organizations seeking to develop sound programs of international cultural relations.

World Handbook of Educational Organization and Statistics. UNESCO Publication. New York 27, Columbia University Press, 1952. 469 p. $9.

Following a 13-page introduction on "Comparative Education and International Educational Statistics," the work includes an account of education in each of 57 countries. All aspects of education are dealt with, including higher education. Includes a glossary of terms.

You and Your Students, by a Faculty Committee. Cambridge, Mass., Massachusetts Institute of Technology, 1952. Third printing, revised. 32 p.

A manual intended to distill from the work of successful teachers of the institution "those principles which have a recognized soundness, and to set these down in an orderly fashion as a starting point for further development and improvement." Treats such topics as the learning process, objectives, technique of teaching, testing, grading, and counseling.

The Younger American Scholar: His Collegiate Origins, by Robert H. Knapp and Joseph J. Greenbaum. Chicago, Ill., The University of Chicago Press, 1953. 122 p. $3.

A study of the relative achievements of some 600 American undergraduate institutions in the production of individuals who won postgraduate academic distinction between 1946 and 1951. Reveals certain important characteristics of undergraduate institutions in the production of scholars.

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